

AMENDMENT

(AMENDMENT PURSUANT TO THE PROVISION OF
ART. 11 OF THE PATENT LAW)

To: Mr. OGAWA Hiroshi, Esq.

Examiner of the Patent Office

1. Indication of the International Application:

PCT/JP2004/007002

2. Applicant:

Name: Nihon University

Address: 8-24, Kudan-minami 4-Chome, Chiyoda-ku, Tokyo, 102-8275

JAPAN

Country of nationality: Japan

Country of residence: Japan

3. Agent:

Name: TAKAHASHI Toshitada

Patent Attorney (Reg. No. 7169)

Address: FUJIKI BLDG. 13-3, NISHISINBASHI 2-Chome,

Minato-ku, Tokyo 105-0003 Japan

4. Item to be amended: Specification and claims

5. Content of amendment:

as attached hereto

(1) An amendment is made to the specification from line 25 on page

4 "However, since the orthopedic apparatus 40 as shown in... to line

15 on page 5 "(claim 1)."

(2) An amendment is made to the specification from line 16 on page 5 " According to the present invention which is embodied as..." to line 9 on page 8 " Fig.2 is a front view of the bone file according to the..."

(3) Claims 1 is amended, Claims 2, 3 and 4 are deleted and Claims 5 and 6 are added.

6. List of documents amended or added:

(1) Specification (pages 4 through 8)

(2) Claims (pages 20 and 21)

file 23a with respect to the center of axle of the shank 23s.

However, the rotary apparatuses 25 to 29 are very likely to involve and damage blood vessels, nerves and other soft tissues.

Furthermore, when the conventional orthopedic apparatus 13 is used to make an incision in the area between the gingivobuccal sulcus and the buccal mucosa in accordance with the intraoral method, a surface 3c parallel to the gingivobuccal sulcus can be trimmed as shown in Fig.14, but a cut surface 3d of the angle of jaw almost perpendicular to the gingivobuccal sulcus cannot be trimmed. Consequently, it is impossible to trim (or polish) burrs on the cut surface of the angle of jaw adequately.

In order to solve the problem that it is impossible to trim the cut surface of the angle of jaw, an orthopedic apparatus 40 as shown in Figs.21 and 22 is proposed.

This orthopedic apparatus 40 has file ridges 40b inside a curved portion 40a at its front end, so that the cut surface 3d of the angle of jaw can be trimmed without damaging facial arteries and veins, nerves and so on in the vicinity of the angle of jaw 3, by reciprocating the apparatus in the direction of arrow indicated in Fig.22 with the inside of the curved portion 40a in contact with the cut surface 3d of the angle of jaw, as shown in Fig.22.

However, since the orthopedic apparatus 40 as shown in

Figs.21 and 22 is large, a problem arises that a large incision must be made in a limited space, namely the area between the gingivobuccal sulcus and the buccal mucosa, in order to allow insertion of its front end or reciprocating motion in the direction of arrow in Fig.22 for trimming the cut surface of the angle of jaw.

As shown in Fig.22, when trimming burrs on the cut surface 3d of the angle of jaw with the orthopedic apparatus 40, a surgeon must hold the apparatus with his/her hands H1 and H2 during a trimming operation, which means that both hands H1 and H2 of the surgeon are completely unavailable or not free.

Besides, when burrs on the cut surface of the angle of jaw are to be trimmed by the orthopedic apparatus 40 as shown in Fig.21, it is impossible to perform trimming unless the patient's lower jawbone 3 is fixed properly. Therefore, another human hand H3 is needed to fix the patient's lower jawbone 3 (or the skull 1).

Disclosure of the Invention

The present invention has been proposed in view of the above problem inherent to the conventional techniques and is intended to provide an orthopedic apparatus which enables safe trimming without damaging facial arteries/veins and nerves in the vicinity of the angle of jaw and without the

need for making a large incision and allows a surgeon to perform trimming by one hand and reduces the number of persons required for an operation.

An orthopedic apparatus according to the present invention (for example, a file 10) which is used to remove burrs generated on a cut surface (3d) of an angle of jaw (3), the apparatus comprising:

a straight shank (11);

a fan-shaped member (12) which is provided at the front end of the shank (11); and

a coupling (13) which is provided at the rear end of the shank (11) and is to be connected to a driving source (30),

wherein:

the fan-shaped member (12) is inclined with respect to an axis line (L) by an inclination angle (θ),

file ridges (14) are formed on the fan-shaped member (12)'s reverse surface, oriented toward the rear end of the shank (11), and

the shank (11) is constructed so as to rotate (oscillate) into a clockwise direction and a counterclockwise direction continuously (Claim 1).

According to the present invention which is embodied as mentioned above, the object (for example, a cut surface 3d of the angle of jaw 3) can be trimmed by oscillating the shank (11) and the fan-shaped portion (12) continuously with the

file ridges (14) formed on the surface (reverse side) of the fan-shaped member (12) oriented toward the rear end of the shank in contact with the object to be trimmed (for example, the cut surface 3d of the angle of jaw 3).

The shank (11) is constructed so as to rotate into clockwise direction and counterclockwise direction continuously. This means that it does not rotate in one direction continuously, and arteries and veins, nerves and other soft tissues in the vicinity of the angle of jaw (3) will not get caught in the file (14); therefore there is no possibility of damaging the surrounding soft tissues and high safety is ensured.

Since the file ridges (14) are oscillated by a driving source (30) for trimming, the whole apparatus can be compact and it is unnecessary to move the apparatus handle largely by hand. Therefore, for example, when trimming the cut surface (3d) of the angle of jaw through an incision made in the area between the gingivobuccal sulcus and the buccal mucosa, the incision need not be large.

In the present invention, the shank (11) is straight.

The reason is as follows. For example, when the present invention is used to trim the cut surface (3d) of the angle of jaw in accordance with the intraoral method, if the shank (11) should be bent or curved, it would be difficult to trim the cut surface (3d) of the angle of jaw through an incision

made in the area between the gingivobuccal sulcus and the buccal mucosa using the fan-shaped member (12). Therefore, the incision must be large.

In the present invention, it is preferable that the inclination angle (θ) of the fan-shaped member (12) with respect to the axis line (L) is in the range from 10 to 120 degrees.

In embodying the present invention, it is preferable that the rotation angle in which the shank (11) rotates into a clockwise direction and a counterclockwise direction continuously is in the range from 5 to 30 degrees.

Brief Description of the Drawings

Fig.1 is a side view of a bone file according to an embodiment of the invention;

Fig.2 is a front view of the bone file according to the embodiment of the invention;

Fig.3 shows the key part of the file of Fig.1 in enlarged form;

Fig.4 is an assembly drawing showing the bone file according to the embodiment of the invention which is fitted to the handpiece through an attachment, together with a fastening tool;

Fig.5 is a layout drawing separately showing the components of the bone file according to the embodiment of

the invention before they are assembled onto the handpiece through the attachment, together with the fastening tool;

Fig.6 is a view of the bone file in a tilted position according to the embodiment of the invention showing how the bone file is used for an orthopedic operation;

Fig.7 is a view of the bone file in a slightly tilted position according to the embodiment of the invention